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Quaternary Fault and Fold Database of the United States

As of January 12, 2017, the USGS maintains a limited number of metadata fields that characterize the Quaternary faults and folds of the United States. For the most up-to-date information, please refer to the interactive fault map.

unnamed faults on the Llano de Manzano (Class A) No. 2117

Last Review Date: 2016-06-26

Compiled in cooperation with the New Mexico Bureau of Geology & Mineral Resources

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Synopsis	These unnamed faults are mostly marked by scarps on the early Pleistocene Llano de Manzano surface. Two fault trends are apparent in this group of structures. In the southeastern corner of the Albuquerque-Belen basin, two en echelon, northeast-trending faults offset the Llano de Manzano 5–20 m and may represent the active eastern rift margin between the West Joyita fault [2110] to the south and the Hubbell Spring fault [2120] to the north. Further north, a group of faults offset the Llano de Manzano 5–20 m about 8 km east-southeast of Belen extending nearly 30 km northwards into southernmost Bernalillo County. These faults

	may fill the gap between the Hubbell Springs fault to the north and the two possible rift margin faults to the south, although this group of faults lies 6–10 km westward of the Hubbell Spring fault.
Name comments	These structures include numerous northeast-trending faults on the Llano de Manzano in the southeastern part of the Albuquerque-Belen basin as mapped by Machette and McGimsey (1983 #1024), Rawling and McCraw (2004 #7466, 2004 #7471), Rawling (2005 #7465), Olig and Zachariasen (2010 #7219), and Reinhart and others (2014 #7472) as well as unpublished mapping by C.T. Cikoski (pers. comm., 2016).
County(s) and State(s)	VALENCIA COUNTY, NEW MEXICO BERNALILLO COUNTY, NEW MEXICO SOCORRO COUNTY, NEW MEXICO
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:24,000 scale. *Comments:* Fault traces from 1:24,000-scale maps of Rawling and McCraw (2004 #7466, 2004 #7471), Rawling (2005 #7465), and Reinhart and others (2014 #7472) as well as unpublished mapping by C.T. Cikoski (pers. comm., 2016). Also includes fault traces from 1:100,000-scale map of Olig and Zachariasen (2010 #7219) digitized at 1:24,000 scale by Jochems using photogrammetric analysis. Originally compiled by Machette and McGimsey (1983 #1024) at 1:250,000 scale.
Geologic setting	Most of these faults are intrabasin structures, but the southernmost faults in this group may form the active eastern margin of the Rio Grande rift in the southeastern part of the Albuquerque-Belen basin. Many of these faults are thought to be relatively deep-seated (e.g., Grauch and Connell, 2013 #7268), but they typically exhibit relatively little offset of surficial sediments. Basaltic andesite flows capping Black Butte (~24–29 Ma) in the southeast part of the fault zone are offset 85–155 m (Reinhart and others, 2014 #7472).
Length (km)	68 km.
Average strike	N20°E

Sense of movement	Normal
Dip Direction	E; W
Paleoseismology studies	
Geomorphic expression	The traces of these faults are marked by subdued, discontinuously preserved fault scarps that are mostly covered by eolian sand. Machette and McGimsey (1983 #1024) estimated offsets of 5–20 m associated with the fault scarps.
Age of faulted surficial deposits	Machette (1978 #1223), Machette and McGimsey (1983 #1024), and subsequent workers mapped these faults in surficial deposits of early and middle Pleistocene age.
Historic earthquake	
Most recent prehistoric deformation	middle and late Quaternary (<750 ka) *Comments:* Machette and McGimsey (1983 #1024) estimated that the latest events on these faults are no older than the middle Pleistocene.
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* Low slip-rate category assigned based on offsets of 5–20 m of the early Pleistocene (approximately 1 Ma) Llano de Manzano (Machette and McGimsey, 1983 #1024).
Date and Compiler(s)	2016 Andrew P. Jochems, New Mexico Bureau of Geology & Mineral Resources Stephen F. Personius, U.S. Geological Survey
References	#7268 Grauch, V.J.S., and Connell, S.D., 2013, New perspectives on the geometry of the Albuquerque basin, Rio Grande rift, New Mexico: Insights from geophysical models of rift-fill thickness, *in* Hudson, M.R., and Grauch, V.J.S., eds., New perspectives on Rio Grande rift basins—From tectonics to groundwater: Geological Society of America Special Paper 494, p. 427–462, doi:10.1130/2013.2494(16).

	#1024 Machette, M.N., and McGimsey, R.G., 1983, Map of Quaternary and Pliocene faults in the Socorro and western part of the Fort Sumner 1° x 2° quadrangles, central New Mexico: U.S. Geological Survey Miscellaneous Field Studies Map MF-1465-A, 12 p. pamphlet, 1 sheet, scale 1:250,000. #1223 Machette, M.N., compiler, 1978, Preliminary geologic map of the Socorro 1° by 2° quadrangle, central New Mexico: U.S. Geological Survey Open-File Report 78-607, 1 sheet, scale 1:250,000. #7219 Olig, S., and Zachariasen, J., 2010, Additional analyses and mapping of the Hubbell Spring and other intrabasin faults south of Albuquerque, New Mexico: New Mexico Bureau of Geology and Mineral Resources Open-File Report 527, 49 p. and 1 plate (scale 1:100,000). #7465 Rawling, G., 2005, Geologic map of the Tome SE 7.5-minute quadrangle, Valencia County, New Mexico: New Mexico Bureau of Geology and Mineral Resources Open-File Geologic Map 109, scale 1:24,000. #7466 Rawling, G.C., and McCraw, D.J., 2004, Geologic map of the Tome NE 7.5-minute quadrangle, Valencia County, New Mexico: New Mexico Bureau of Geology and Mineral Resources Open-File Geologic Map 91, scale 1:24,000. #7471 Rawling, G.C., and McCraw, D.J., 2004, Geologic map of the Tome 7.5-minute quadrangle, Valencia County, New Mexico: New Mexico Bureau of Geology and Mineral Resources Open-File Geologic Map 90, scale 1:24,000. #7472 Reinhart, A.J., Love, D.W., and Miller, P.L., 2014, Geologic map of the Black Butte 7.5-minute quadrangle, Socorro and Valencia Counties, New Mexico: New Mexico Bureau of Geology and Mineral Resources Open-File Geologic Map 235, scale 1:24,000.

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